

## BSc Honours Molecular Biology and Biotechnology

Minimum Requirements for Graduation: GPA Cumulative Average 60% and Major Average 70%

### RECOMMENDED COURSE SEQUENCE

#### Fall Semester:

#### Winter Semester:

##### Year 1: Ten Courses Including:

- BIOL 1101** – Cell Biology
- CHEM 1100** – General Chemistry I
- COMP 1047** – Comp. Concepts End-Users or **COMP-2067** Programming for Beginners
- MATH 1720** or **MATH 1760** – Differential Calculus
- PHYS 1300** – Intro Physics Life Sciences I or **PHYS 1400** – Intro Physics I

- BIOL 1111** – Biological Diversity
- CHEM 1110** – General Chemistry II
- PHYS 1310** – Intro Physics Life Sciences II or **PHYS 1410** – Intro Physics II
- STAT 2910** – Statistics for the Sciences
- \_\_\_\_\_ Any Area of Study Course

##### Year 2: Ten Courses Including:

- BIOL 2071** – Intro Microbiology & Techniques
- BIOL 2101** – Ecology
- BIOL 2111** – Genetics
- CHEM 2300** – Intro Organic Chemistry I
- \_\_\_\_\_ Any Area of Study Course

- BIOC 2010** – Organic Chem. of Biomolecules
- BIOM 2131** – Introductory Molecular Biology
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Any Area of Study Course

##### Year 3: Ten Courses Including:

- BIOC 3100** – Metabolism I
- BIOM 3500** – Molecular Cell Biology
- BIOM 3581** – Biotech Lab (Semester 1)
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Any Area of Study Course

- BIOC 3110** – Metabolism II
- BIOC 3130** – Protein and Nucleic Acid Chemistry
- BIOL 3142** – Evolution
- BIOM 3530** – Advanced Cell Biology
- BIOM 3581** – Biotech Lab (Semester 2)

##### Year 4: Ten Courses Including:

- BIOL 4570** – Plant Molecular Biology & Physiology
- BIOL 4904**<sup>†</sup> (Semester 1) – Undergrad Research Biology
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*

- BIOC 4010** – Bioinformatics/Genomics/Proteomics
- BIOM 4560** – Molecular Biotechnology
- BIOL 4904**<sup>†</sup> (Semester 2) – Undergrad Research Biology
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*
- \_\_\_\_\_ Mol Bio&Biotech\* or Biochem/Chem/Bio Option\*\*

\*Must choose 5 courses from the following **Mol Bio & Biotech Options:**

- |   |   |   |   |
|---|---|---|---|
| <input type="checkbox"/> <b>BIOL 3022</b> | <input type="checkbox"/> <b>BIOM 3070</b> | <input type="checkbox"/> <b>BIOM 3550</b> | <input type="checkbox"/> <b>BIOM 4540</b> |
| <input type="checkbox"/> <b>BIOL 3571</b> | <input type="checkbox"/> <b>BIOM 3071</b> | <input type="checkbox"/> <b>BIOM 4530</b> | <input type="checkbox"/> <b>BIOM 4590</b> |

\*\*Must Choose 3 courses from the following **Biochem/Chem/Bio Options:**

- |   |   |   |   |
|---|---|---|---|
| <input type="checkbox"/> <b>BIOC 4030</b> | <input type="checkbox"/> <b>BIOL 2480</b> | <input type="checkbox"/> <b>BIOL 4481</b> | <input type="checkbox"/> <b>CHEM 2500</b> |
| <input type="checkbox"/> <b>BIOC 4050</b> | <input type="checkbox"/> <b>BIOL 4232</b> | <input type="checkbox"/> <b>BIOM 4440</b> | <input type="checkbox"/> <b>CHEM 3210</b> |
| <input type="checkbox"/> <b>BIOL 4008</b> | <input type="checkbox"/> <b>BIOL 4450</b> | <input type="checkbox"/> <b>CHEM 2200</b> |   |

<sup>†</sup>Requires pre-requisites, a 70% major GPA, and 60% cumulative GPA

Students considering application to some Pharmacy schools are advised to take CHEM-2400.

Students planning to write the MCAT or DAT may wish to take PSYC-1150 and PSYC-1160 (Social Science) and GART-1500 or ENGL-1001 (Art/Language)

**CORE COURSES SUMMARY****CORE COURSES (A) – BIOLOGY & BIOMEDICAL: Total 11 Courses**Complete **ALL** of the following:

- BIOL 1101** – Cell Biology
- BIOL 1111** – Biological Diversity
- BIOL 2071** – Intro Microbiology & Tech.
- BIOL 2101** – Ecology
- BIOL 2111** – Genetics
- BIOM 2131** – Intro Molecular Biology
- BIOL 3142** – Evolution
- BIOM 3500** – Molecular Cell Biology
- BIOM 3530** – Advanced Cell Biology
- BIOM 4560** – Molecular Biotechnology
- BIOL 4570** – Plant Molecular Biology & Physiology

**CORE COURSES (B) – BIOLOGY & BIOMEDICAL: Total 4 Courses**Complete **ALL** of the following pair:

- BIOL 4904 (2 semesters)** - Undergrad Research Biology
- BIOM 3581A & 3581B** – Biotechnology

**CORE COURSES – CHEMISTRY: Total 8 Courses**Complete **8** of the following:

- BIOC 2010** – Organic Chem. of Biomolecules
- BIOC 3100** – Metabolism I
- BIOC 3110** – Metabolism II
- BIOC 3130** – Protein and Nucleic Acid Chemistry
- BIOC 4010** – Bioinformatics/Genomics/Proteomics
- CHEM 1100** – General Chemistry I
- CHEM 1110** – General Chemistry II
- CHEM 2300** – Intro Organic Chemistry I

**PHYSICS PAIR: Total 2 Courses**Complete **1 PAIR** of the following:

- PHYS 1300 & 1310** – Intro Physics Life Sciences I & II
- PHYS 1400 & 1410** – Intro Physics I & II

**COMPUTER SCIENCE COURSE: Total 1 Courses**Complete **1** of the following:

- COMP 1047** – Comp. Concepts End-Users
- COMP-2067** – Programming for Beginners

**MATH COURSES: Total 2 Courses**

- MATH 1720** or **MATH 1760** – Differential Calculus
- STAT 2910** – Statistics for the Sciences

**MOLECULAR BIO & BIOTECHNOLOGY COURSES: – Total 5 courses**Complete **5** of the following

- BIOL 3022** – Res. Principles/Study Design Biology
- BIOL 3571** – Animal Cells and Tissues
- BIOM 3070** – Medical Microbiology **OR** **BIOM 3071** – Medical Micro. And Techniques (cannot take both)
- BIOM 3550** – Embryology
- BIOM 4530** – Biology of Cell Transformation
- BIOM 4540** – Regenerative Biology and Disease
- BIOM 4590** – Epigenetics

**ADDITIONAL CHEM, BIOCHEM, BIO COURSES: – Total 3 courses**Complete **3** of the following:

- BIOC 4030** – Enzymology and Biotechnology
- BIOC 4050** – Drug Design
- BIOL 4008** – Special Topics
- BIOL 2480** – Principles of Neuroscience
- BIOL 4232** – Pollution Ecology
- BIOL 4450** – Behavioural Neurobiology
- BIOL 4481** – Excitable Cells
- BIOM 4440** – Neurophysiology
- CHEM 2200** – Analytical Chemistry
- CHEM 2500** – Intro. Inorganic Chemistry
- CHEM 3210** – Princ. of Instrumental Analysis

**ADDITIONAL COURSES – Total 4 courses****Any Area of Study** – Choose **4** Courses (Recommend a minimum of one Arts/Language and one Social Science)